

15. (a) Explain Barton reaction with mechanism.

Or

- (b) Illustrate photochemical rearrangement of 1,5 diene.

SECTION C — ( $3 \times 10 = 30$  marks)

Answer any THREE questions.

16. Demonstrate the role of 1,3- dithiane in umpolung strategy.
17. Explain the importance of alternate synthetic routes in organic synthesis to improve the efficiency of a synthetic process?
18. Discuss the types and mechanisms of sigmatropic rearrangements, including [1,3], [1,5], [3,3], and [5,5] carbon migrations with suitable examples.
19. Elaborate the reactions of electronically excited ketones with examples.
20. Assess the significance of the di- $\pi$ -methane rearrangement in organic synthesis.

NOVEMBER/DECEMBER 2024

**23PCH31 — ORGANIC SYNTHESIS AND  
PHOTOCHEMISTRY**

Time : Three hours

Maximum : 75 marks

SECTION A — ( $10 \times 2 = 20$  marks)

Answer ALL questions.

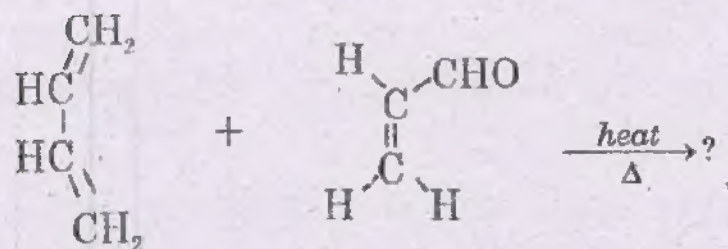
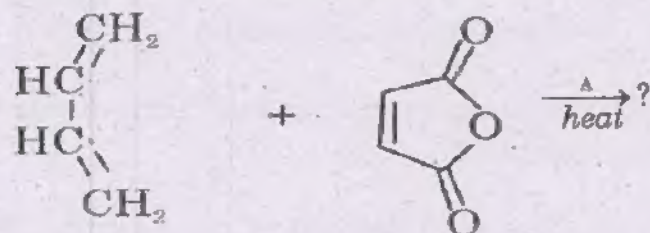
1. What is the concept of retrosynthetic analysis in organic chemistry?
2. "Bridging elements assist in organic synthesis" Justify.
3. Identify a common reagent for carbonyl group protection.
4. What is the purpose of protecting thiol groups during synthesis?
5. Give any examples for [2+4] cycloaddition.
6. Classify the types of Pericyclic Reactions.
7. Define intersystem crossing in photochemistry.
8. Predict the outcome of energy transfer between two specific molecules.



9. Give cis-trans structure for the following compounds

- Dimethyl propane
- Dibromocyclohexane

10. Predict the product and name it



SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Differentiate between linear and convergent synthesis.

Or

(b) Describe the Seebach Umpolung concept and explain its significance in organic synthesis.

12. (a) Explain the synthesis of mono and bifunctional organic compounds via disconnection approach with suitable examples.

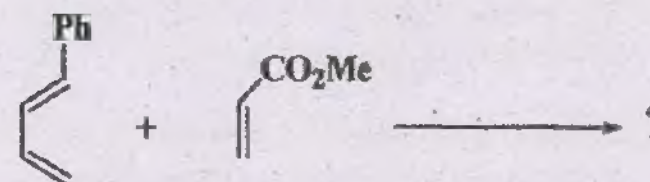
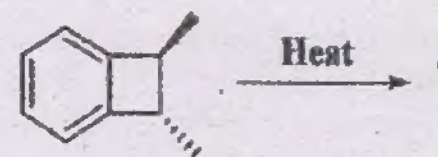
Or

(b) Explain any two protecting groups for carbonyl and amino groups.

13. (a) [2+2] cycloaddition reaction is thermally forbidden but photochemically allowed. Justify using molecular orbital theory.

Or

(b) Predict the products with a detailed mechanism :



14. (a) Discuss the Stern Volmer equation.

Or

(b) Prepare a short note on the Paternò-Büchi reaction with examples.